War Section.

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Hospital Ships in Peace and War:

PRESIDENT'S ADDRESS.

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HISTORICAL.

Old French and British records show that so-called sea-going hospital ships were attached to fleets even as early as the end of the seventeenth century, and a French report about this time recommended the use of a ship entirely devoted to the sick and completely staffed and equipped. The difficulties in trans-shipment, however, inherent in sail power, seem to have led to a comparative failure of the principle when tried at the Battle of Beachy Head in 1690.

The first *modern* vessels to be used for the purpose were two converted iron steamships, for the China operations of 1860. These were in attendance upon the Army and their employment was followed at intervals during last century by that of others fitted out for similar purposes. One of the first purely *naval* hospital ships was provided by Japan for the war with China in 1894-5; and the *Malacca*, in 1897, was equipped by our own Navy to serve as a base hospital for the Benin expedition.

Considerable numbers of such vessels served during the Spanish-American and South African wars, the Boxer troubles, and the Russo-Japanese war, mainly in attendance upon the respective armies as sick transports. Since early in the present century permanent naval hospital ships have been a feature of the American Navy, as well as of our own, and are of interest to us to-night, from the fact that such vessels provide the only examples of sea-going floating hospitals utilized in peace time.

Finally, during the Great War of 1914-18, no fewer than twenty-one naval and eighty-four military *hospital ships* were provided by this country alone; these ranged from the gigantic *Mauretania* (30,784 gross tonnage) down to the small "drifter" *Queen Alexandra* (268 gross tonnage).

Owing to the enormous proportion of the overseas campaigns undertaken by the Empire, these numbers far exceeded the total employed for the purpose by the Allies and enemy combined.

THE EVOLUTION OF THE HOSPITAL SHIP.

Naturally it is a far cry from the old time floating hospital to the ship of to-day and in most directions improvement has been continuous. The substitution of metal for wood, the application of steam to water-supply, pumping, heating, and disinfection, and of electricity to lighting, ventilation,

heating and laundry, and the cold storage system for food have all played a notable part in this development. Advances in medical and surgical science have at the same time emphasized the necessity for surgical cleanliness and all it implies, cubic space, fresh air and sunlight, in the treatment of disease and injury.

Nevertheless, in some ways the provision of ventilation, and more particularly of equability of temperature, is more difficult in the metal steamship than in the old wooden vessel, and it is in the direction of lessening movement, vibration and noise, the improvement of ventilation, and the control of " wild heat " (heat given off in ships by main and auxiliary engines, steam pipes, &c., which produces unequal and irregular heating in the living parts), that further improvement can mainly be expected.

Some Essentials in Construction and Equipment.

The one outstanding advantage of a ship originally designed for hospital purposes is that it would be possible so to arrange the details of construction as to economize space in the highest degree and, at the same time, to ensure that every section occupies the most convenient and appropriate position.

Unfortunately in the present state of world finance only the United States (which has provided such a vessel) can afford the necessary expenditure, and less fortunate countries either have to depend on vessels adapted for the purpose, or follow the Japanese plan of designing certain mercantile craft with a view to such conversion.

At present, therefore, hospital ships must be improvised from already existent vessels, and the first question to be considered is that of size, which has already been shown to have varied in the recent war from that of the *Mauretania* downwards. In spite of the proved usefulness of these leviathans in rapidly conveying large numbers from Gallipoli and elsewhere and their steadiness at sea, their use for the purpose is nevertheless attended by disadvantages quite apart from possible administrative difficulties. For example, the *Aquitania* and *Britannic* were too large to enter the harbours at Alexandria and Malta and the number of cases for passage to England at Mudros was not always sufficient to fill them, fitted as they were for 3,500 and 4,000 men respectively. Consequently special arrangements had to be made to avoid demurrage at Mudros. All their coal and water had to be transported there and the daily consumption of these big ships was considerable even when at anchor.

In general, the combination of a draught shallow enough to enter ordinary harbours with sufficient tonnage to accommodate 300 or 400 patients on decks at least 7½ ft. in height, with the principal wards situated above the water line, and providing 500 cubic feet of space per head, will meet requirements.

Nor is there under ordinary circumstances any very great advantage in high speed, as this implies greater cost, absorption of space, production of " wild " heat, more frequent replenishment, larger crews, and increase of discomfort in bad weather. A cruising speed of about 10-12 knots, with something extra for emergencies, is probably sufficient, and as regards purely *naval* hospital ships subsequent remarks on their method of employment will also be found to have a bearing on this point.

From their increased cleanliness and the ease of replenishment oil-burners are, of course, advantageous.

Steadiness at sea and maximum freedom from vibration are of importance and, if possible, the principal wards should be located where movement is least felt and the ship is least " wet." Promenade decks assist in the latter and help ventilation in bad weather.

It stands to reason that steam power must suffice for the subsidiary purposes already mentioned in addition to motive power, and that the electrical plant should be capable of providing for lighting, ventilation, hoists and so on. It is decidedly an advantage if the ship be already fitted with wireless, submarine signalling and refrigerating rooms and other stores; while her storage capacity for water and the yield from her distilling plant should be very large. It is also of extreme importance that her general construction should facilitate the fitting of easy approaches to the principal wards and of lifts in convenient positions.

Usually it is desirable to locate aft and on the upper deck those departments which are apt to produce unpleasant odours or from which infective material may be derived, such as infectious wards, mortuary, laundry and disinfector. The possibilities of traffic have also an important bearing on the positions of such departments as the disinfector, where the disinfection of hospital parties has to be constantly carried out, and also the dental department. Proximity to a gangway, and to a bathroom in the case of the disinfector, is consequently indicated.

With regard to equipment it is impossible to make more than a passing reference. All that can be said is that it includes everything that is requisite for medical, surgical, zymotic and mental wards and their annexes, operating, dental, bacteriological and post-mortem departments and laundries, galleys, pantries, latrines and wash-places attached to the hospital, in addition to the requirements of the crew and staff.

It is to be noted that as a result of a meeting held in the Transport Department in November, 1922, it was agreed by representatives of the Naval and Army Medical, and the Admiralty and War Office Transport Departments that the specification for naval and military hospital ships should, in future, be practically identical. The meeting also decided that military hospital carriers should be provided in future on the same lines as the naval vessels of the kind. The main differences that remained were that a dental department and a steam laundry were confined to naval ships, only a hand-laundry being provided in the others.

The Uses of Hospital Ships in Peace Time.

The only vessels of the sort which have been utilized in time of peace are the Naval Hospital Ship *Maine* in our own Service and a few similar craft in other navies, such as the *Solace* and *Relief* in the United States Service. Their main uses have to some extent varied. Not infrequently, for example, the *Maine* has accompanied fleets and squadrons for cruises, and the *Solace* accompanied the American fleet around the world. On the other hand, for a long time, while Mediterranean fever held sway, the *Maine* was chiefly concerned with the transport of invalided men to England, whilst at other times she acted as a base hospital for destroyers in Sliema harbour.

Whatever the particular duty the *Maine* has been engaged upon, she has, when attached to a fleet or squadron, provided, in addition to the ordinary medical and surgical work, accommodation for isolation and equipment for disinfection of bedding and effects, together with laboratory facilities for the diagnosis of infectious disease. Of late years, too, she or her successor has provided for the dental work of all or part of the Fleet, X-ray, throat, nose, ear and eye examinations for the smaller ships, for which also the treatment of venereal disease has been undertaken, while, finally, her mortuary has been available in cases where inquiry is necessary. All this is leaving out of account the value of the extra training-ground she has provided for medical officers and sick-berth staff.

Hospital Ships in War-time.

Most of the objects to which reference has just been made become of even greater importance in time of war, and this especially applies to measures such as isolation, disinfection and laboratory work in connexion with zymotic disease, which tend to preserve the health of the personnel, and also to those which minimize the effects of disease, such as the continuous treatment of venereal ailments. Needless to say, it is a vital point in war to keep the personnel as physically fit as possible.

The one outstanding difference, however, between the two forms of hospital ship is that the war-time hospital ship must always be prepared for admissions or discharges in mass. It is not meant that this never occurs in peace-time, but admission or discharge in mass is then decidedly exceptional, whereas in war it is one of the main objects for which the ship is employed, and speed in dealing with the emergency is frequently of the first importance.

For example, at Gallipoli the naval and military hospital ships admitted literally thousands of cases in a comparatively short time and these crowds of cases usually came in rushes. Up to the time of the evacuation the *Rewa* had dealt with over 20,000 cases and another naval ship, the *Soudan*, within fourteen days received over 2,300 wounded, rescued and cared for 440 survivors from a wrecked ship, and, finally, removed 106 sick and wounded from a ship with her coal bunkers on fire.

Naval engagements of any magnitude were infrequent, but after the battle of Jutland the *Plassy* received at one time 192 cases, many suffering from severe wounds and scalds, and, as the result of the blowing up of the *Natal*, 131 survivors were received on board the *Drina*.

Now in order to deal effectively with such occurrences as these, it is not only necessary to considerably augment the peace-time medical and nursing staff, a measure which is provided for by the instructions, but it is also essential carefully to organize beforehand the routine for the embarkation and disembarkation of the incapacitated with their effects, and for the provision of the necessary documents which must accompany them. It is also necessary to prepare an organization for providing emergency beds or billets for occasions such as the rescue of a shipwrecked crew, when the ordinary accommodation is entirely occupied.

The Admiralty Scheme for the Organization of Hospital Ship Assistance in War.

This was designed after the South African War by the Transport Department, who were responsible for the military as well as the naval vessels. It was put into action during the Great War, and the whole organization worked with distinguished success.

Briefly, it consisted in the compilation of instructions which specified in detail the various structural alterations and additions required, while the necessary fittings, equipment, stores, and so on were constantly kept ready for use at any moment. To facilitate the taking up of several vessels plans were made of such as would serve as types, and this planning was kept up to date.

For immediate requirements, what were known as hospital carriers, capable of being sent to sea in forty-eight hours, which would embark artizans to continue the work after sailing, were provided for the Navy, and these were replaced after three or four weeks by the more elaborately fitted hospital ships proper. These carriers will, in future, be provided for military purposes also if required. They are essentially stop-gaps, and were taken over

"all standing," being provided with a specified equipment, kept in a central depot to minimize delays in supplying it wherever required.

POLICY GOVERNING THE EMPLOYMENT OF HOSPITAL SHIPS.

With regard to the military ships this is simple enough, as they merely act either as hospital transports, as at Gallipoli and during the South African War, or as base hospitals, as in some of our minor expeditions abroad. With the naval vessels it is, however, somewhat different, and it was pretty generally realized, even before the Great War, that they would operate at a considerable distance from the scene of hostilities. Their comparatively low speed and consequent risk of hampering the Fleet or revealing its presence, the development of heavy gun, torpedo and mine, together with the possibilities of wireless communication, all argued in favour of this probability.

Their main spheres of usefulness were considered to be the preliminary clearing of the ships and nearest hospitals preceding hostilities, and, naturally, after action, the reception of the injured and incapacitated. In order to perform this latter function it was thought that they would probably lie at some neighbouring base till after action, when the Commander-in-Chief might call them up to the Fleet in order to avoid the detachment of any of his fighting units. As a matter of fact this never occurred, and the wounded were always conveyed to them at the base, although it is possible that if the Germans had risked a general action early in the war when the Fleets were more evenly matched, there might have been another story. On the whole, however, even this seems improbable on account of the fact that the area of hostilities was so limited that the enemy's coast line was never more than twenty-four hours' steaming from the base, and with the enormous numbers engaged in this narrow area and their high speed the hospital ship would almost certainly hamper operations. Moreover, in modern naval warfare the fighting ships exhaust their fuel and munitions so rapidly that a return for replenishment is soon necessary, as at Jutland, and their speed is so much greater than that of the hospital ship that retention of the wounded on board is likely to be preferred. But, in addition to this, the indiscriminate sowing of mines and the torpedoing of ships by submarines practically eliminated the possibility of any trans-shipment except in a protected area.

Probably these considerations will operate in any future war, as, except for the possibility of operations in a less confined area and an international limitation of the uses of mine and torpedo, the deterrent influences are likely to increase rather than to diminish. In this connexion the great developments in aerial warfare may be referred to. But the comparatively limited experience of the *Plassy* and similar craft has also shown that they are not at all well adapted for the *prolonged* treatment of the scalds and severe injuries resulting from a naval action, owing to the lack of cubic space, limitations of ship ventilation, and difficulties of moving and manipulating patients.

It follows that their chief functions after a naval action will probably be those of acting as a casualty clearing station, of giving the severely shocked time to recover before being moved, of dealing with emergency cases, of weeding out all capable of movement, and finally of acting as base hospitals for the remnant whose condition compels their retention. This is leaving out of account the possibility of a hospital ship accompanying a fleet during a prolonged cruise, similar to that of Rojdesvensky to the Far East. The occurrences of this war do not negative such a possibility, but the chances are perhaps against it. It is noteworthy that no such vessel accompaniey Admiral Sturdee's squadron, probably on account of the speed and secrecd

required, although here he was proceeding to a part of the world ill-supplied with hospitals, and in search of the notorious German gunnery fleet. The prospects of a heavy casualty list were by no means inconsiderable.

Rules Governing the Employment of Hospital Ships.

These are laid down in the articles of the Geneva Convention which were signed and ratified by all the representative powers at the Hague Convention in 1899. This Convention was later amended by the Hague Conference of October, 1907, and was signed by the representatives of thirty-two states; but this amendment has never been ratified by the British Government. The British Government, however, at the beginning of the recent war, declared that it would abide by the Hague Conventions if enemy Governments would do the same, and there the matter has rested.

The Articles of the Amended Convention deal mainly with the immunity of those hospital ships and their personnel which have been duly notified to the belligerents, with the distinguishing marks which should be used to identify them, and with rules prohibiting their use for any combatant purpose.

For *gross* breaches of the Convention the present clauses are sufficiently clear. Thus, during the late war, the German hospital ship, *Ophelia*, was captured in 1915, and condemned by the London Prize Court. It was held that her equipment was much better adapted for acting as a signalling ship than for her proper purpose and that, in fact, she had never attempted to render service to the sick and wounded, whereas she was under grave suspicion of having served as a signalling unit.

Nevertheless, there is a very general agreement that certain clauses present ambiguities and require very much more precise definition. But the elaboration of a formula to which all parties can subscribe and which is sufficiently binding to prevent any wriggling out of its provisions is a matter that is beset with difficulties. These remarks apply more particularly to the articles which specify the classes of material and personnel which it is permissible to convey in these vessels in war-time.

During the war the right of search was seldom exercised: by the Germans because their surface craft had few opportunities and their submarines probably preferred not to betray their presence unnecessarily, and by the Allies because enemy hospital ships were seldom far from their own bases. In a future war, however, things might be quite different and the present lack of clarity on these points would very likely lead to disputes as to the meaning of various articles. To an unscrupulous enemy, too, it offers opportunities of profiting by these ambiguities. This was illustrated when the Germans made allegations of the conveyance of combatants in hospital ships a pretext for sinking them without warning.

A first step towards remedying this state of affairs was taken by a Sub-committee of the Admiralty Reconstruction Committee in 1919. Article 4 lays down that hospital ships shall afford "relief and assistance to the wounded, sick and shipwrecked of the belligerents." In the opinion of the Sub-committee there could be no difficulty about the interpretation of the word "shipwrecked" but the case was different with regard to the "sick and wounded," owing to the absence of any satisfactory line of demarcation between those that are, and those that are not, entitled to the benefits of the Convention.

They proposed the following definition of the sick and wounded persons who are thus entitled:—

(*a*) Officers and men of the naval, military, or air forces.

(*b*) Persons (male and female) employed by the Government in connexion with the fighting services. (This definition they quite recognized was lacking in absolute precision.)

(*c*) Officers and men of the mercantile marine.

(*d*) Personnel belonging to the Red Cross Organization.

With regard to the carriage of healthy medical personnel and surplus stores, other than those required for the ships in which they were embarked, it was considered that on the whole it was better that this should be entirely prohibited. Here humanitarian considerations conflict with the military requirements of blockade. For instance, in the late war, rubber, cotton, and fats thus carried might have been turned to military uses by the enemy, and although the Foreign Office agreed to pass medical stores to American Red Cross Units in enemy countries, this was coupled with an insistence on the rationing of fats and rubber and the destruction of all old stores. Even this concesssion was opposed by naval and military authorities.

A final point dealt with the German interpretation of the article which gives belligerents the right to order hospital ships to take a certain course. The Germans made use of this to issue a notice, warning off all such vessels from a zone in the Channel and North Sea, and the Committee considered that it should be made quite clear that this clause can only be exercised by officers of the belligerent forces who actually intercept the hospital ship.

Here the whole of these matters remain at the moment.